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TEST REPORT

ACCORDING TO: FCC 47 CFR Part 90, subpart F, and subpart B, Class B

FOR:

Magos System Ltd.

AR-300 Drone Detection Sensor

Product name: AR300

FCC ID: 2AFHU-AR300

This report is in conformity with ISO/ IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested. This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

Table of contents

1 Applicant information

Client name:	Magos Systems Ltd.
Address:	13 Gad Feinstein Rd, Rehovot, Israel
Telephone:	077-4140155
Fax:	077-4140165
E-mail:	amit@magossystems.com
Contact name:	Mr. Amit Isseroff

2 Equipment under test attributes

Product name:	AR-300 Drone Detection Sensor
Product type:	Transceiver
Model(s):	AR300
Serial number:	144300-002
Hardware version:	144300
Software release:	0.6.0-master4063
Receipt date	30-May-23

3 Manufacturer information

Manufacturer name:	Magos Systems Ltd.
Address:	13 Gad Feinstein Rd, Rehovot, Israel
Telephone:	077-4140155
Fax:	077-4140165
E-Mail:	amit@magossystems.com
Contact name:	Mr. Amit Isseroff

4 Test details

Project ID:	50926
Location:	Hermon Laboratories Ltd. 66 HaTachana str., P.O. Box 23, Binyamina 3055001, Israel
Test started:	25-Jun-23
Test completed:	16-Jul-23
Test specification(s):	FCC 47 CFR Part 90, subpart F, and subpart B, Class B

5 Tests summary

Test	Status
Transmitter characteristics	
FCC Section 90.103, Maximum output power	
FCC Section 90.209, Occupied bandwidth	Pass
FCC Section 90.210, Radiated spurious emissions	Pass
FCC Section 90.213, Frequency stability	Pass
Unintentional emissions	
Section 15.109, Radiated emission	Pass

This test report supersedes the previously issued test report identified by Doc ID: MAGRAD_FCC.50926_Rev1

Testing was completed against all relevant requirements of the test standard. However, results obtained indicate that the product under test complies in full with the requirements tested.
The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
Tested by:	Mrs. E. Pitt, test engineer, EMC & Radio	25-Jun-23 – 16-Jul-23	
Reviewed by:	Mrs. S. Peysahov Sheynin, certification specialist, EMC & Radio	18-Oct-23	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	18-Oct-23	

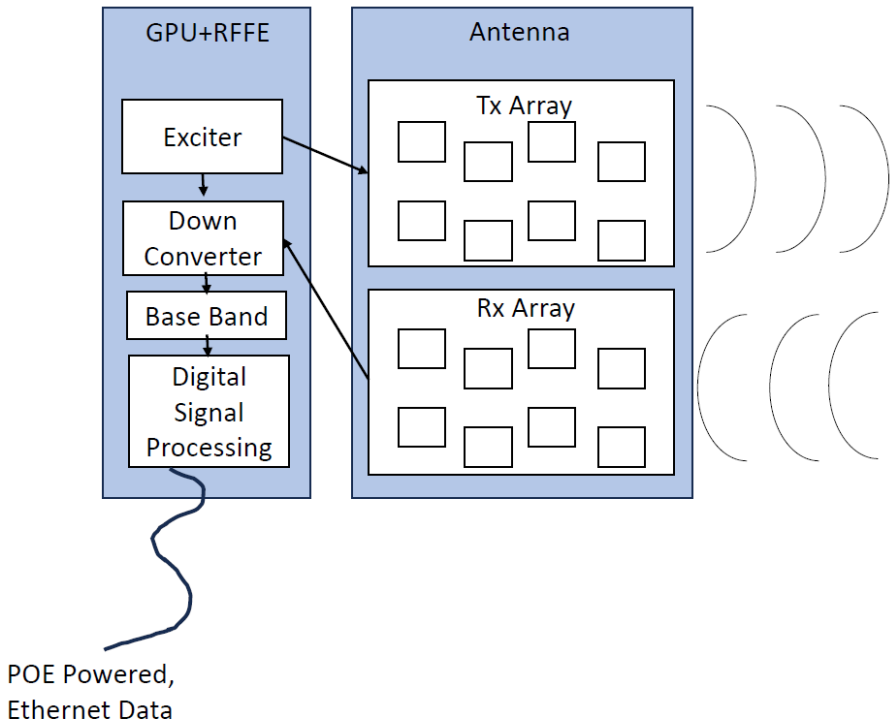
6 EUT description

Note: The following data in this clause is provided by the customer and represents his sole responsibility

6.1 General information

The EUT is an AR-300 Drone Detection Sensor:
The AR-300 is a cost-effective perimeter protection solution including airborne drone targets.
The AR-300 is an LFM-CW radar based sensor utilizing MIMO, digital beamforming and other state of the art techniques.

6.2 Test configuration



6.3 Changes made in EUT

No changes were implemented in the EUT during testing.

6.4 Transmitter characteristics

Type of equipment	
X	Stand-alone (Equipment with or without its own control provisions)
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)
	Plug-in card (Equipment intended for a variety of host systems)

Intended use		**Condition of use**
X	fixed	Always at a distance more than 2 m from all people
	mobile	Always at a distance more than 20 cm from all people
	portable	May operate at a distance closer than 20 cm to human body

Assigned frequency ranges	10 – 10.5 GHz

Maximum rated output power	At transmitter 50 Ω RF output connector	8 dBm

Is transmitter output power variable?	X	No			
		Yes		continuous variable	
				stepped variable with stepsize	dB
			minimum RF power		dBm
			maximum RF power		dBm

Antenna connection					
X	unique coupling	standard connector	integral		with temporary RF connector
				X	without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Integral	Magos Systems Ltd.	MSA1056A	5 dBi

Transmitter aggregate data rate/s	NA

Type of modulation	LFM-CW

Modulating test signal (baseband)	LFM-CW

Transmitter power source					
	Battery	**Nominal rated voltage**		Battery type	
X	DC	**Nominal rated voltage**	48 VDC		
	AC mains	**Nominal rated voltage**		Frequency	

Test specification:	Section 90.205, Section 90.103 (c) (13) Maximum output power		
Test procedure:	47 CFR, Section 2.1046; ANSI C63.26, section 5.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Jul-23		
Temperature: 23 ºC	Relative Humidity: 48 %	Air Pressure: 1012 hPa	Power: 230 VAC, 50 Hz
Remarks: Retest			

7 Transmitter tests according to 47CFR part 90

7.1 Peak output power test

7.1.1 General

This test was performed to measure effective radiated power emanated by transmitter at carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 Peak output power limits

Assigned frequency band, MHz	Maximum peak output power	
	W	dBm
10000-10500	5	37

7.1.2 Test procedure for field strength measurements

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and the performance check was conducted.

7.1.2.2 The field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was swept throughout the range, specified in Table 7.1.2, in both vertical and horizontal polarizations.

7.1.2.3 The worst test results (the lowest margins) were recorded in Table 7.1.2 and shown in the associated plots.

7.1.3 Test procedure for substitution ERP measurements

7.1.3.1 The test equipment was set up as shown in Figure 7.1.2 and energized.

7.1.3.2 RF signal generator was set to the EUT carrier frequency and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.

7.1.3.3 The test antenna height was swept throughout the specified in Table 7.1.2 range to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.

7.1.3.4 The ERP was calculated as a sum of signal generator output power in dBm and antenna gain in dBd reduced by cable loss in dB.

7.1.3.5 The above procedure was performed in both horizontal and vertical polarizations of the test antenna.

7.1.3.6 The worst test results (the lowest margins) were recorded in Table 7.1.3 and shown in the associated plots.

Test specification:	**Section 90.205, Section 90.103 (c) (13) Maximum output power**		
Test procedure:	47 CFR, Section 2.1046; ANSI C63.26, section 5.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Jul-23		
Temperature: 23 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1012 hPa	**Power:** 230 VAC, 50 Hz
Remarks: Retest			

Figure 7.1.1 Setup for carrier field strength measurements

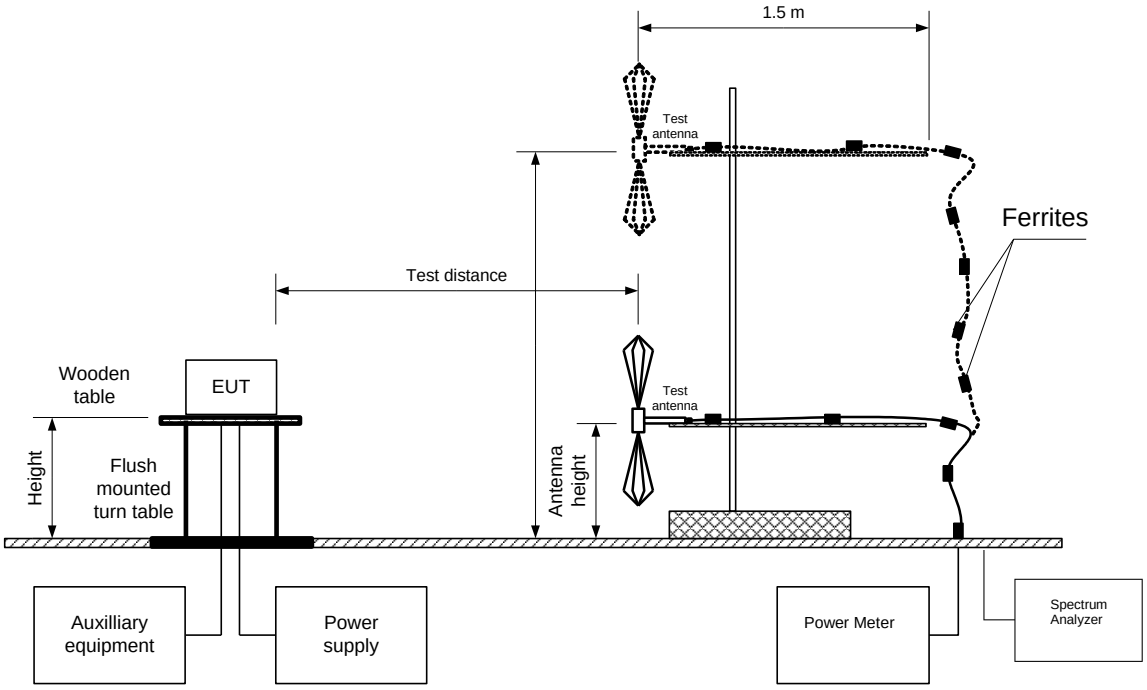
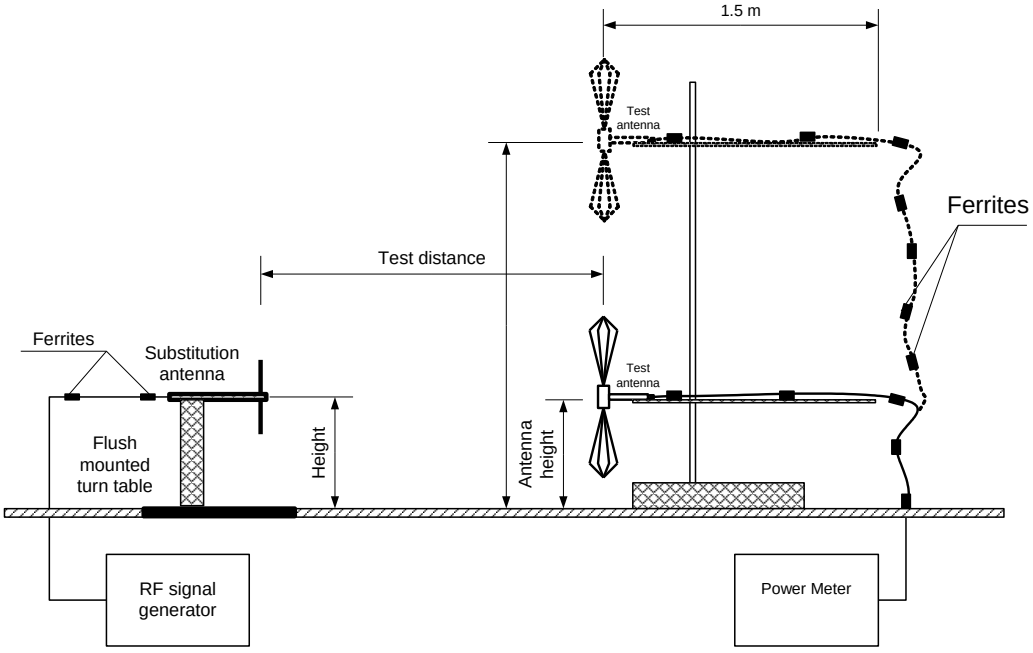


Figure 7.1.2 Setup for substitution ERP measurements



Test specification:	**Section 90.205, Section 90.103 (c) (13) Maximum output power**		
Test procedure:	47 CFR, Section 2.1046; ANSI C63.26, section 5.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Jul-23		
Temperature: 23 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1012 hPa	**Power:** 230 VAC, 50 Hz
Remarks: Retest			

Table 7.1.2 Transmitter carrier field strength

ASSIGNED FREQUENCY RANGE: 10-10.5 GHz
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
EUT HEIGHT: 1.5 m
TEST ANTENNA HEIGHTS RANGE: 1.0 – 4.0 m
DETECTOR USED: Peak

Frequency, GHz	Field strength, dB(µV/m)	Measured channel, power, dBm*	Limit, dB(µV/m)	Margin, dB**	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position***, degrees
10-10.5	118.24	-3.5	NA	NA	1000	H	1.5	180

* Measured channel power with wideband peak power meter

**- Margin = Field strength – calculated field strength limit.

***- EUT front panel refers to 0 degrees position of turntable.

Table 7.1.3 Substitution measurements for equivalent isotropic radiated power under normal conditions

TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 1.5 m
TEST ANTENNA HEIGHTS RANGE: 1.0 – 4.0 m
DETECTOR USED: Peak
SUBSTITUTION ANTENNA TYPE: Horn

Frequency, MHz	Measured channel, power, dBm*	RF generator output, dBm	Ant gain, dBi	Cable loss, dB	EIRP, dBm	Sum RF output power dBm***	Limit, dBm	Margin, dB**	Verdict
10-10.5	-3.5	11	13	2.1	22	8	37	-29	Pass

* Measured channel power with wideband peak power meter

** Margin = RF output power – specification limit.

*** Sum RF output Power=EIRP-EUT's Antenna gain -10log(N), where N = 1,2,…,8 number of chain

Reference numbers of test equipment used

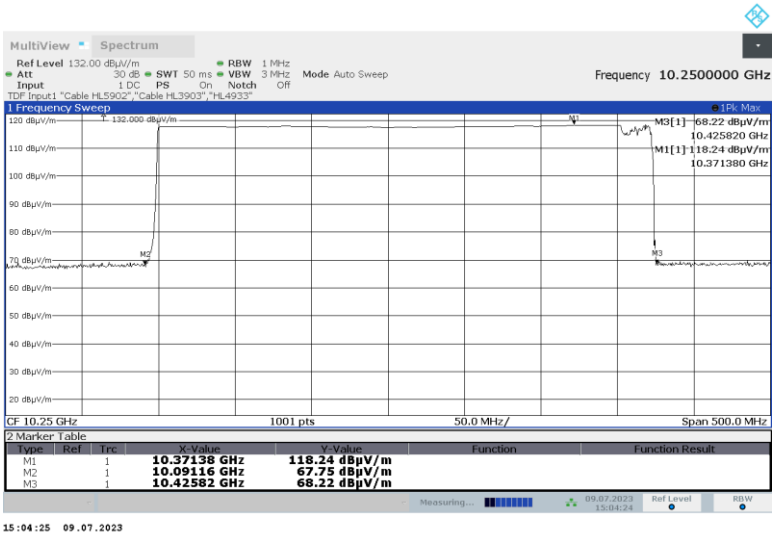
HL 7585	HL 3903	HL 5902	HL 4933	HL 3301	HL 3302	HL 4114	HL 5672
HL 5371							

Full description is given in Appendix A.

Test specification:	**Section 90.205, Section 90.103 (c) (13) Maximum output power**		
Test procedure:	47 CFR, Section 2.1046; ANSI C63.26, section 5.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Jul-23		
Temperature: 23 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1012 hPa	**Power:** 230 VAC, 50 Hz
Remarks: Retest			

Plot 7.1.1 Transmitter carrier field strength

ASSIGNED FREQUENCY RANGE:	10-10.5 GHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber
RESOLUTION BANDWIDTH:	1000 kHz



Test specification:	Section 90.213, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-A Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	16-Jul-23		
Temperature: 23 ºC	Relative Humidity: 48 %	Air Pressure: 1002 hPa	Power: 48 VDC
Remarks:			

7.2 Frequency stability test

7.2.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.2.1

Table 7.2.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement
10000-10500	In the assigned frequency range

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

7.2.2.2 The EUT power was turned off. Temperature within test chamber was set to +30˚C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

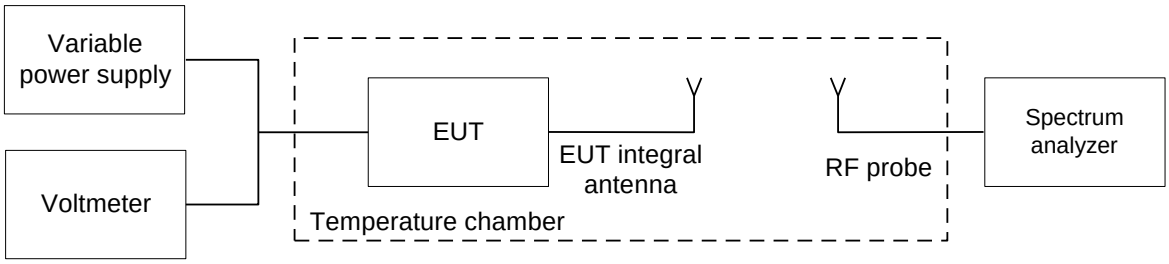
7.2.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

7.2.2.4 The above procedure was repeated at 0˚C and at the lowest test temperature.

7.2.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.

7.2.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.2.2.

Figure 7.2.1 Frequency stability test setup



Test specification:	**Section 90.213, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-A Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jul-23		
Temperature: 23 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1002 hPa	**Power:** 48 VDC
Remarks:			

Table 7.2.2 Frequency stability test results

OPERATING FREQUENCY:	10000-10500 MHz
NOMINAL POWER VOLTAGE:	48 V
TEMPERATURE STABILIZATION PERIOD:	20 min
POWER DURING TEMPERATURE TRANSITION:	Off
SPECTRUM ANALYZER MODE:	Counter
RESOLUTION BANDWIDTH:	100 Hz
VIDEO BANDWIDTH:	300 Hz
MODULATION:	Unmodulated

Temp., ºC	Voltage, V	Frequency, MHz							Max frequency drift, Hz		Limit, Hz	Margin, Hz	Verdict
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative			
Low frequency 10.01 GHz													
-30	nominal	10010.133476	10010.133407	10010.133370	10010.133345	10010.133206	10010.133156	10010.132845	N/A	72954		N/A	Pass
-20	nominal	10010.123027	10010.123346	10010.123829	10010.124308	10010.124658	10010.124996	10010.126614	N/A	66092		N/A	Pass
-10	nominal	10010.072750	10010.080150	10010.081329	10010.082461	10010.086123	10010.086804	10010.091068	N/A	30546		N/A	Pass
0	nominal	10010.062773	10010.064104	10010.065211	10010.066302	10010.067321	10010.068148	10010.070065	N/A	9543		N/A	Pass
10	nominal	10010.056452	10010.056554	10010.057246	10010.057687	10010.058810	10010.059768	10010.062431	4070	1909		N/A	Pass
20	+15% (55.2v)	10010.055904	10010.051481	10010.050851	10010.049284	10010.047591	10010.046675	10010.042231	18291	N/A	N/A	N/A	Pass
20	nominal	10010.085765	10010.077343	10010.075328	10010.073793	10010.071420	10010.069886	10010.060522*	N/A	25243		N/A	Pass
20	-15% (40.8v)	10010.034374	10010.034262	10010.034141	10010.033947	10010.033842	10010.033709	10010.032916	27606	N/A		N/A	Pass
30	nominal	10009.992003	10009.991594	10009.990575	10009.989890	10009.898248	10009.987164	10009.986265	162264	N/A		N/A	Pass
40	nominal	10009.963167	10009.962391	10009.961816	10009.961164	10009.960738	10009.959666	10009.957842	10856	N/A		N/A	Pass
50	nominal	10009.944778	10009.943220	10009.942565	10009.941687	10009.940830	10009.940287	10009.937166	123356	N/A		N/A	Pass
Mid frequency 10.25 GHz													
-30	nominal	10250.161020	10250.160967	10250.160835	10250.160814	10250.160791	10250.160739	10250.160710	N/A	164464		N/A	Pass
-20	nominal	10250.151877	10250.152824	10250.153038	10250.153447	10250.153982	10250.154711	10250.155749	N/A	159193		N/A	Pass
-10	nominal	10250.130481	10250.131562	10250.131960	10250.132284	10250.132954	10250.133295	10250.134900	N/A	138344		N/A	Pass
0	nominal	10250.093996	10250.094416	10250.095643	10250.097167	10250.098025	10250.100260	10250.102516	N/A	105960		N/A	Pass
10	nominal	10250.064188	10250.064763	10250.065865	10250.066971	10250.067421	10250.067900	10250.069343	N/A	72787		N/A	Pass
20	+15% (55.2v)	10249.995593	10249.994946	10.249994395	10249.993797	10249.992952	10249.991324	10249.989396	7160	N/A	N/A	N/A	Pass
20	nominal	10249.997528	10249.996545	10249.996257	10249.996583	10249.996559	10249.996892	10249.996556*	299	972		N/A	Pass
20	-15% (40.8v)	10249.988967	10249.988830	10249.988661	10249.988128	10249.987813	10249.987571	10249.986643	9913	N/A		N/A	Pass
30	nominal	10249.990745	10249.991402	10249.992569	10249.993024	10249.993755	10249.994688	10249.995410	5811	N/A		N/A	Pass
40	nominal	10249.983396	10249.982422	10249.981653	10249.980953	10249.979152	10249.978557	10249.977151	19405	N/A		N/A	Pass
50	nominal	10249.963858	10249.963442	10249963090	10249.962741	10249.962521	10249.962265	10249.960499	36057	N/A		N/A	Pass
High frequency 10.49 GHz													
-30	nominal	10490.164545	10490.164443	10490.164368	10490.164328	10490.164203	10490.164163	10490.163855	N/A	97579		N/A	Pass
-20	nominal	10490.169197	10490.169359	10490.169495	10490.169625	10490.169714	10490.169773	10490.169967	N/A	103001		N/A	Pass
-10	nominal	10490.165730	10490.164611	10490.164390	10490.163972	10490.163745	10490.163524	10490.162288	N/A	98764		N/A	Pass
0	nominal	10490.139729	10490.139271	10490.138747	10490.138347	10490.137596	10490.137381	10490.135690	N/A	72763		N/A	Pass
10	nominal	10490.111541	10490.110838	10490.110188	10490.109214	10490.108562	10490.107921	10490.104237	N/A	44575		N/A	Pass
20	+15% (55.2v)	10490.066469	10490.066579	10490.061716	10490.061366	10490.061002	10490.060655	10490.059718	7248	N/A	N/A	N/A	Pass
20	nominal	10490.077915	10490.076648	10490.075421	10490.074317	10490.073355	10490.072718	10490.066966*	N/A	10949		N/A	Pass
20	-15% (40.8v)	10490.059376	10490.058834	10490.058446	10490.057857	10490.057543	10490.057061	10490.056286	10860	N/A		N/A	Pass
30	nominal	10490.039610	10490.039100	10490.038309	10490.037422	10490.036710	10490.035734	10490.030651	36315	N/A		N/A	Pass
40	nominal	10490.005478	10490.004808	10490.003549	10490.002145	10490.000370	10489.999453	10489.999667	67299	N/A		N/A	Pass
50	nominal	10489.976367	10489.975576	10489.975128	10489.975056	10489.974721	10489.973228	10489.969337	97629	N/A		N/A	Pass

* - Reference frequency

Reference numbers of test equipment used

HL 3230	HL 5376	HL 5391	HL 6105	HL 7546			

Full description is given in Appendix A.

Test specification:	Section 90.209, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jun-23		
Temperature: 23 ºC	Relative Humidity: 48 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1. The test results are provided in Table 7.3.2 and the associated plots.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, %	Limit
10000-10500	99%	OBW shall be within the designated frequency band

* - Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

7.3.2 Test procedure

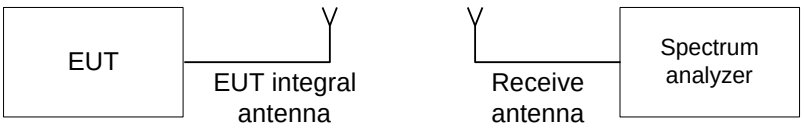
7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

7.3.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.

7.3.2.3 The EUT was set to transmit the normally modulated carrier.

7.3.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup



Test specification:	Section 90.209, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jun-23		
Temperature: 23 ºC	Relative Humidity: 48 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 3 MHz
VIDEO BANDWIDTH: 3 MHz
MODULATION ENVELOPE REFERENCE POINTS: 99%

Carrier frequency, GHz	OBW under normal conditions, MHz	Maximum OBW, MHz*	Limit, MHz	Verdict
10-10.5	299.93	300.094	500	Pass

* OBW under normal conditions by adding the worst frequency error under extreme conditions result

Reference numbers of test equipment used

HL 7585	HL 4933	HL 3903	HL 5902				

Full description is given in Appendix A.

Plot 7.3.1 Occupied bandwidth test result

Test specification:	Section 90.210, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	Relative Humidity: 47 %	Air Pressure: 1005 hPa	Power: 48 VDC
Remarks:			

7.4 Radiated spurious emission measurements

7.4.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emission test limits

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm	Equivalent field strength limit @ 3m, dB(µV/m)***
0.009 –5th harmonic*	43+10logP**	-13	84.4

* - Excluding the in band emission within ± 250 % of the authorized bandwidth from the carrier
** - P is transmitter output power in Watts
*** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows: E=sqrt(30×P×1.64)/r, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

7.4.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

7.4.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.4.2.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.

7.4.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.

7.4.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

7.4.3.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.

7.4.4 Test procedure for substitution ERP measurements of spurious

7.4.4.1 The test equipment was set up as shown in Figure 7.4.3 and energized.

7.4.4.2 RF signal generator was set to the frequency of investigated spurious emission and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.

7.4.4.3 The test antenna height was swept from 1 to 4 m to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.

7.4.4.4 The above procedure was performed in both, horizontal and vertical, polarizations of the test and substitution antennas.

7.4.4.5 The ERP of spurious emissions was calculated as a sum of signal generator output power in dBm and antenna gain in dBd reduced by cable loss in dB.

7.4.4.6 The above procedure was repeated at the rest of investigated frequencies.

7.4.4.7 The worst test results (the lowest margins) were recorded in Table 7.4.3 and shown in the associated plots.

Test specification:	Section 90.210, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	Relative Humidity: 47 %	Air Pressure: 1005 hPa	Power: 48 VDC
Remarks:			

Figure 7.4.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

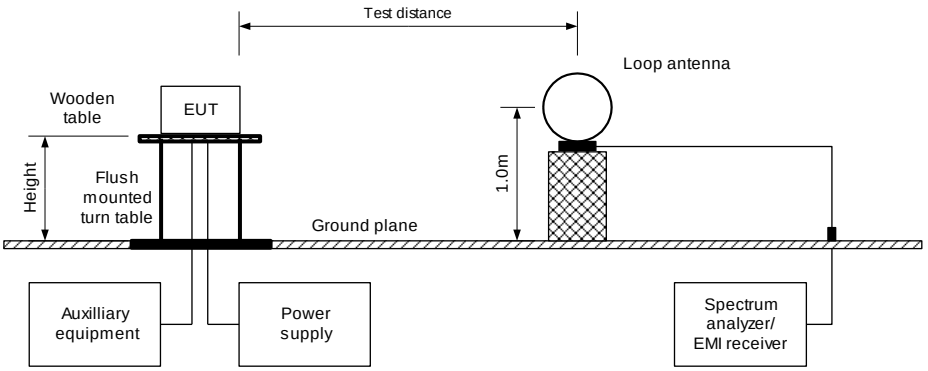
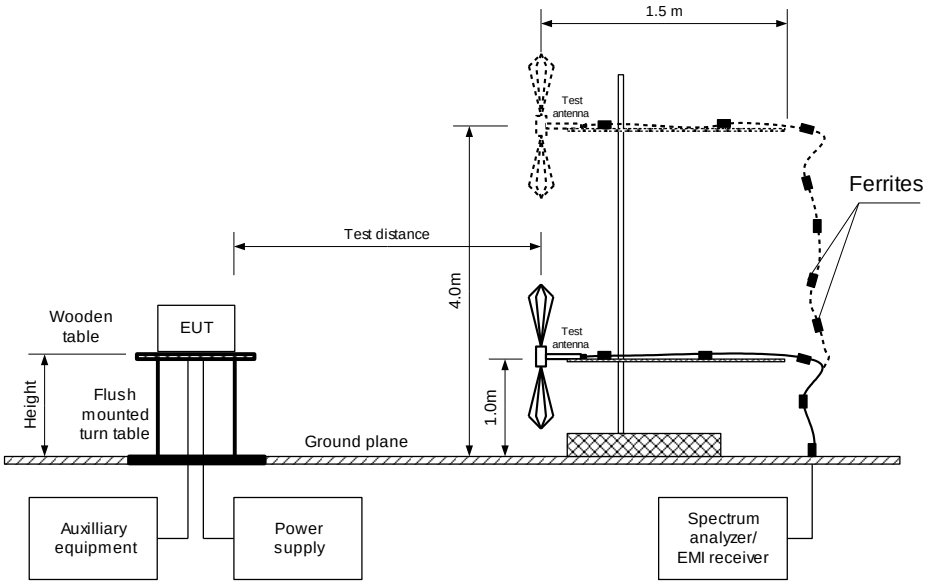
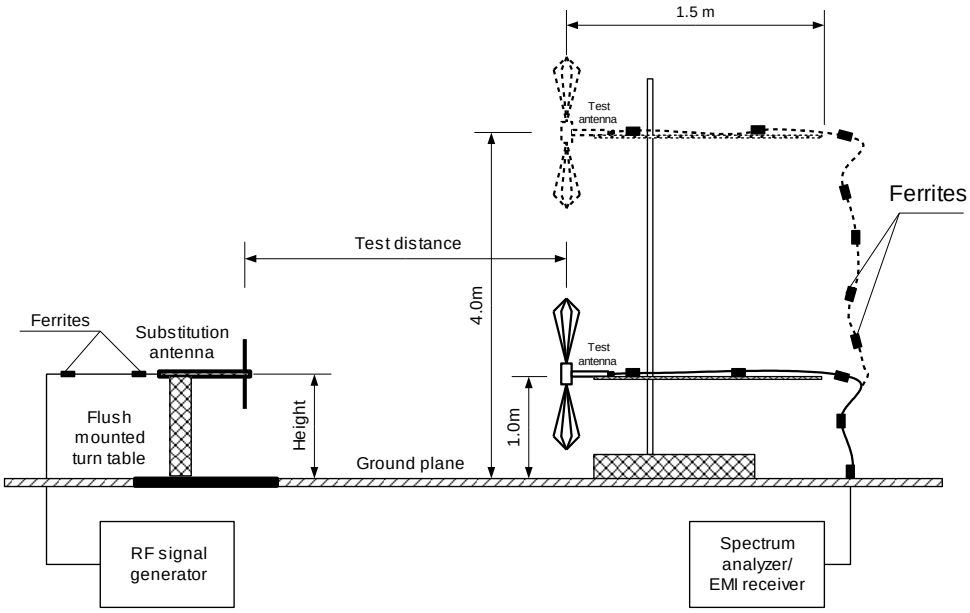


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	Section 90.210, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	Relative Humidity: 47 %	Air Pressure: 1005 hPa	Power: 48 VDC
Remarks:			

Figure 7.4.3 Setup for substitution ERP measurements of spurious



Test specification:	**Section 90.210, Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 47 %	**Air Pressure:** 1005 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE: 10-10.5 GHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 1.5 m
INVESTIGATED FREQUENCY RANGE: 0.009 – 53000 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
Biconilog (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)
MODULATION: LFM

Frequency, MHz	Field strength, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
5167.3	61.27	84.4	-23.13	1000	Horizontal	1.65	6
15160.3	69.20	84.4	-14.80	1000	Vertical	1.90	15
15258.3	69.16	84.4	-14.84	1000	Horizontal	1.90	15
20236.0	72.55	84.4	-11.85	1000	Vertical	1.81	21
20324.0	74.43	84.4	-9.97	1000	Horizontal	1.91	6

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.

Table 7.4.3 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE: 10-10.5 GHz
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 1.5 m
DETECTOR USED: Peak
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength, dB(µV/m)	RBW, kHz	Antenna polarization	RF generator output, dBm	Ant gain, dBd	Cable loss, dB	ERP, dBm	Attenuation below carrier, dBc	Limit, dBm	Margin, dB*	Verdict
5167.3	61.27	1000	Horizontal	-30.7	8.1	1.3	-23.9	N/A	-13	-15.9	Pass
15160.3	69.20	1000	Vertical	-31.5	11.6	2.3	-22.2	N/A	-13	-9.2	Pass
15258.3	69.16	1000	Horizontal	-31.0	11.7	2.3	-21.6	N/A	-13	-8.6	Pass
20236.0	72.55	1000	Vertical	-38.6	20.7	2.6	-20.5	N/A	-13	-7.5	Pass
20324.0	74.43	1000	Horizontal	-36.7	20.8	2.6	-18.5	N/A	-13	-5.5	Pass

*****- Margin = Spurious emission – specification limit.

Reference numbers of test equipment used

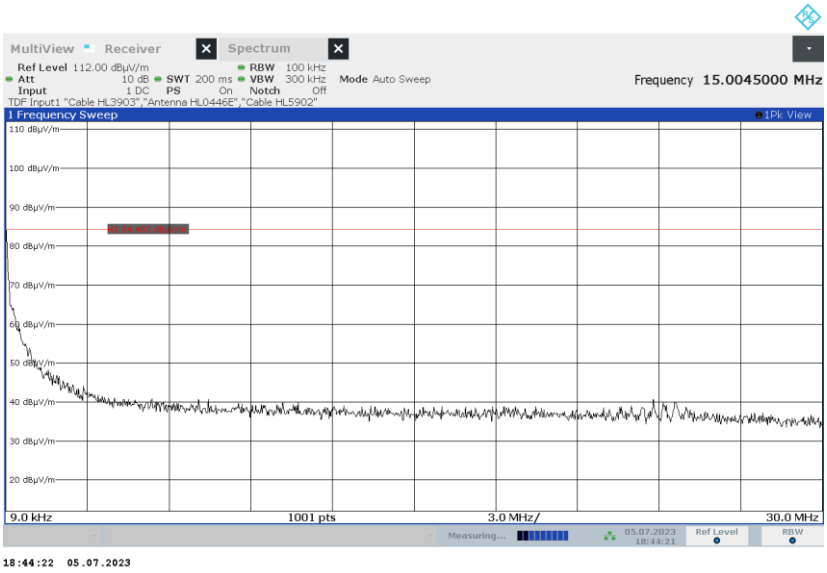
HL 0770	HL 3235	HL 4023	HL 5376	HL 5664	HL 3903	HL 5902	HL 4933
HL 4956	HL 5288	HL 5112	HL 5371	HL 4114			

Full description is given in Appendix A.

Test specification:	**Section 90.210, Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 47 %	**Air Pressure:** 1005 hPa	**Power:** 48 VDC
Remarks:			

Plot 7.4.1 Radiated emission measurements in 0.009-30 MHz range

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m

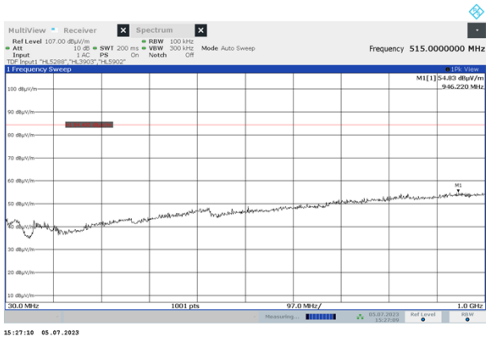


Test specification:	**Section 90.210, Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 47 %	**Air Pressure:** 1005 hPa	**Power:** 48 VDC
Remarks:			

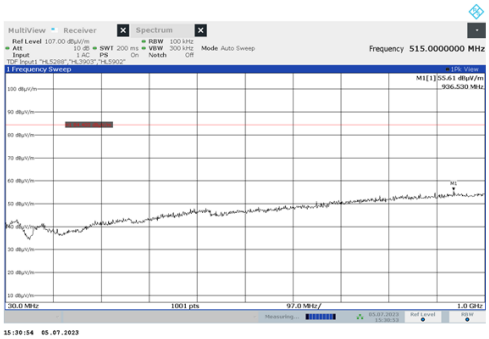
Plot 7.4.2.1 Radiated emission measurements in 30 - 1000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m

Vertical



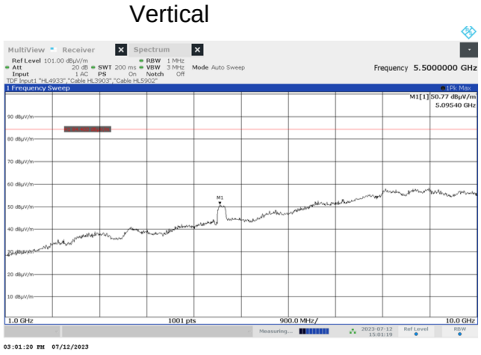
Horizontal



Plot 7.4.3 Radiated emission measurements in 1000 – 10000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m

Vertical



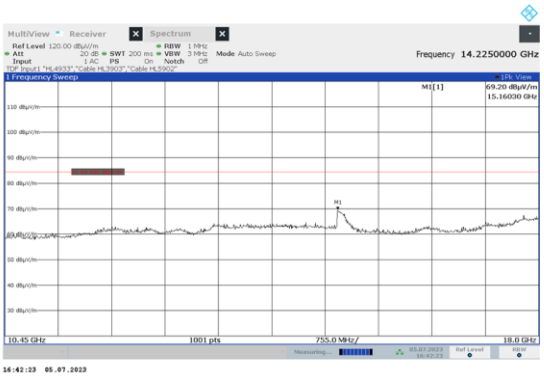
Horizontal

Test specification:	**Section 90.210, Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 47 %	**Air Pressure:** 1005 hPa	**Power:** 48 VDC
Remarks:			

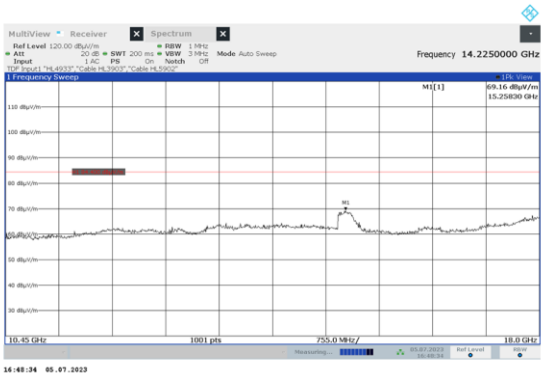
Plot 7.4.4 Radiated emission measurements in 10450 – 18000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m

Vertical

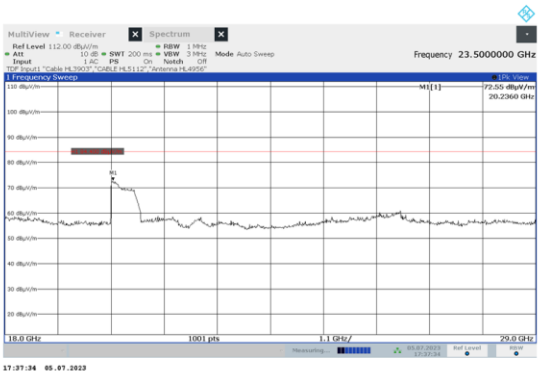


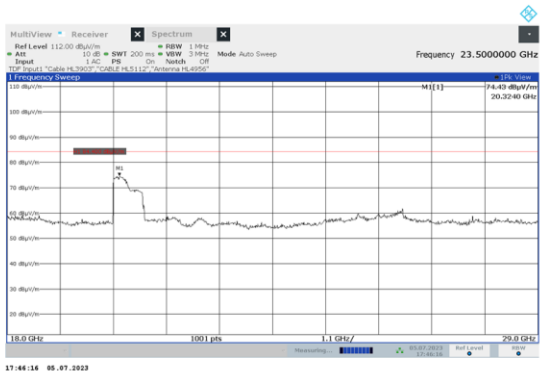
Horizontal



Plot 7.4.5 Radiated emission measurements in 18000 – 29000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



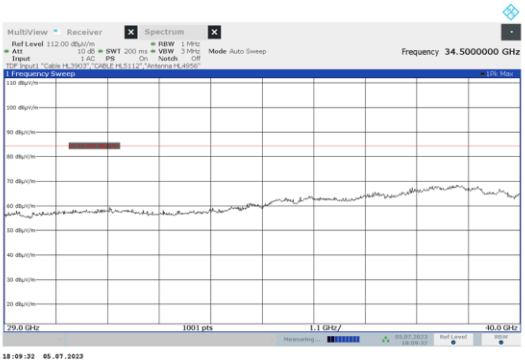


Test specification:	Section 90.210, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1051 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	05-Jul-23 - 12-Jul-23		
Temperature: 24 ºC	Relative Humidity: 47 %	Air Pressure: 1005 hPa	Power: 48 VDC
Remarks:			

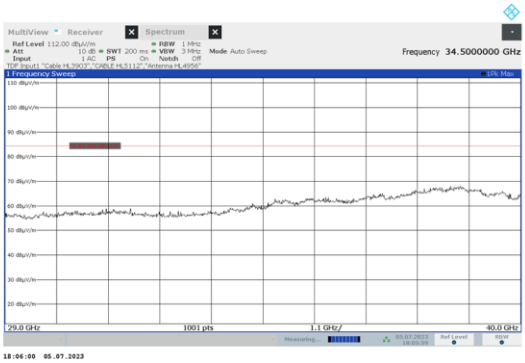
Plot 7.4.6 Radiated emission measurements in 29000 – 40000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m

Vertical



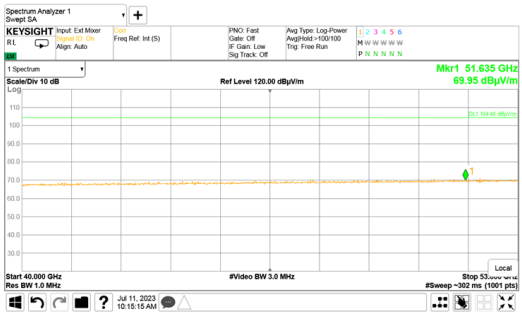
Horizontal



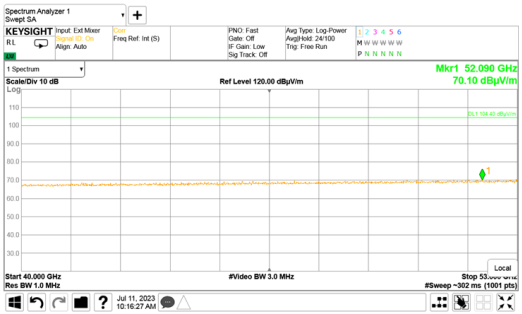
Plot 7.4.7 Radiated emission measurements in 40000 – 53000 MHz range

TEST SITE: OATS
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 0.3 m

Vertical



Horizontal



Note: Field strength of spurious at 1 m=84.4+20 log 3/0.3=104.4

Test specification:	**Section 15.109, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1007 hPa	**Power:** 230 VAC, 50 Hz
Remarks:			

8 Emission tests according to 47CFR part 15 subpart B requirements

8.1 Radiated emission measurements

8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1.

Table 8.1.1 Radiated emission test limits

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0*	39.0	49.5*
88 - 216	33.0*	43.5*	43.5	54.0*
216 - 960	35.5*	46.0*	46.4	56.9*
Above 960	43.5*	54.0*	49.5	60.0*

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where S_1 and S_2 – standard defined and test distance respectively in meters.

8.1.2 Test procedure for measurements in semi-anechoic chamber

8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and Figure 8.1.2 and associated photograph/s, energized and the performance check was conducted.

8.1.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

8.1.2.3 The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Test specification:	**Section 15.109, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1007 hPa	**Power:** 230 VAC, 50 Hz
Remarks:			

Figure 8.1.1 Setup for spurious emission field strength measurements within 30-1000 MHz

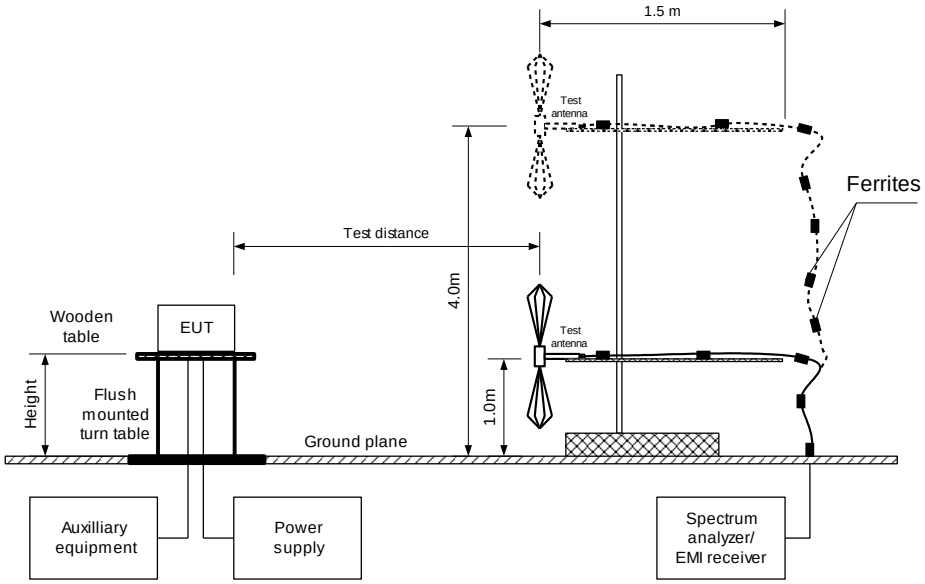
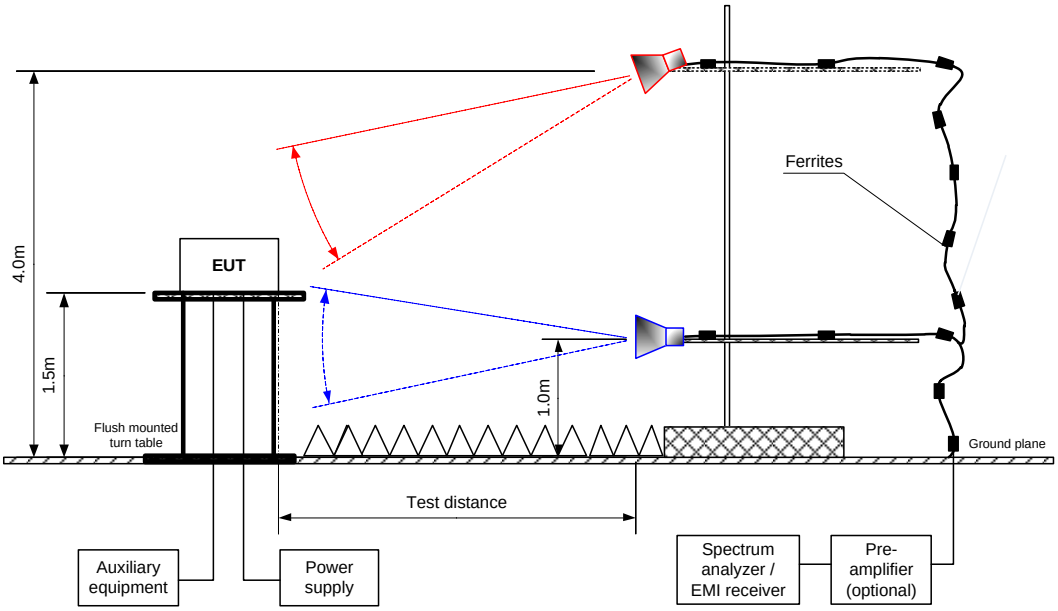


Figure 8.1.2 Setup for spurious emission field strength measurements above1000 MHz



Test specification:	**Section 15.109, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1007 hPa	**Power:** 230 VAC, 50 Hz
Remarks:			

Table 8.1.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive / Stand-by
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 1.1 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)*	Margin, dB*				
46.041	42.60	40.66	48.7	8.05	Vertical	1.00	-180	Pass
58.533	34.28	30.74	48.7	17.97	Vertical	1.00	-180	
95.688	36.55	33.09	52.2	19.11	Horizontal	1.41	-119	
109.800	28.36	25.19	52.2	27.00	Vertical	1.00	-69	
159.489	26.03	21.09	52.2	31.11	Vertical	1.00	-103	
436.128	45.89	43.28	54.72	11.44	Horizontal	1.00	43	

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows:
$Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where S_1 and S_2 – standard defined and test distance respectively in meters.

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 1-1.5 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 - 40000 MHz
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz	Peak			Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
No emissions were found										Pass

*****- Margin = Measured emission - specification limit.
******- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

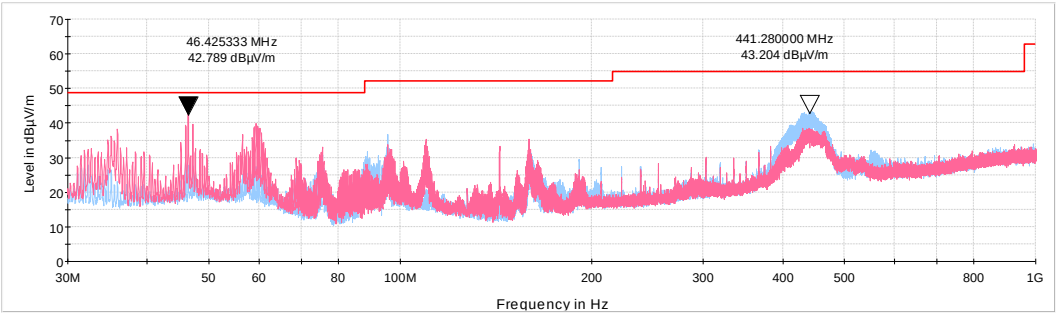
HL 3903	HL 4933	HL 4956	HL 5112	HL 5288	HL 5902		

Full description is given in Appendix A.

Test specification:	**Section 15.109, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1007 hPa	**Power:** 230 VAC, 50 Hz
Remarks:			

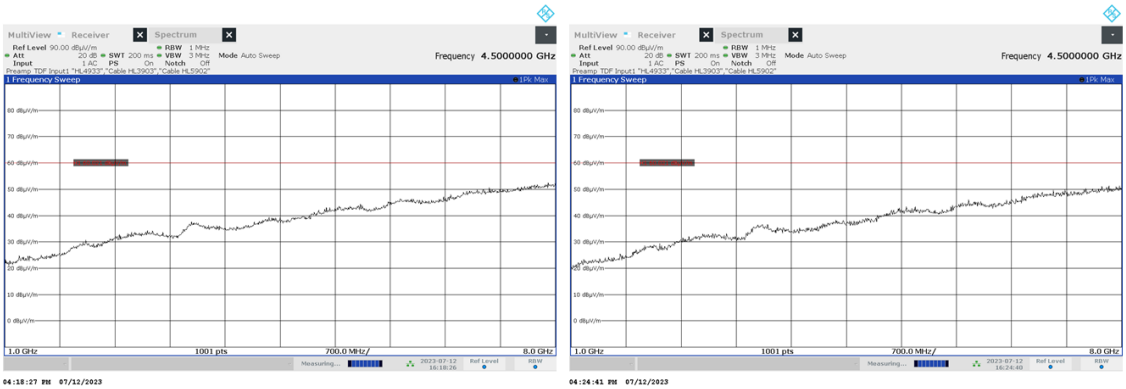
Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 1.1 m
EUT OPERATING MODE: Receive / Stand-by



Plot 8.1.2 Radiated emission measurements 1000 - 8000 MHz, vertical and horizontal antenna polarization

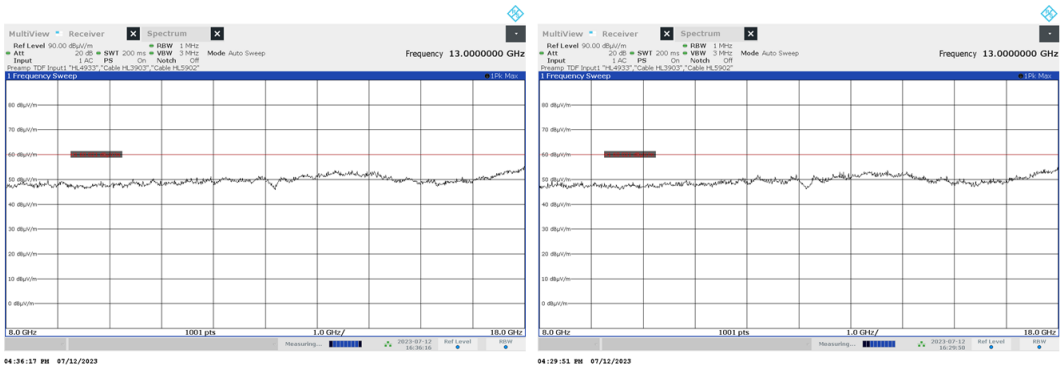
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 1.5 m
EUT OPERATING MODE: Receive / Stand-by



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Jul-23		
Temperature: 24 ºC	Relative Humidity: 48 %	Air Pressure: 1007 hPa	Power: 230 VAC, 50 Hz
Remarks:			

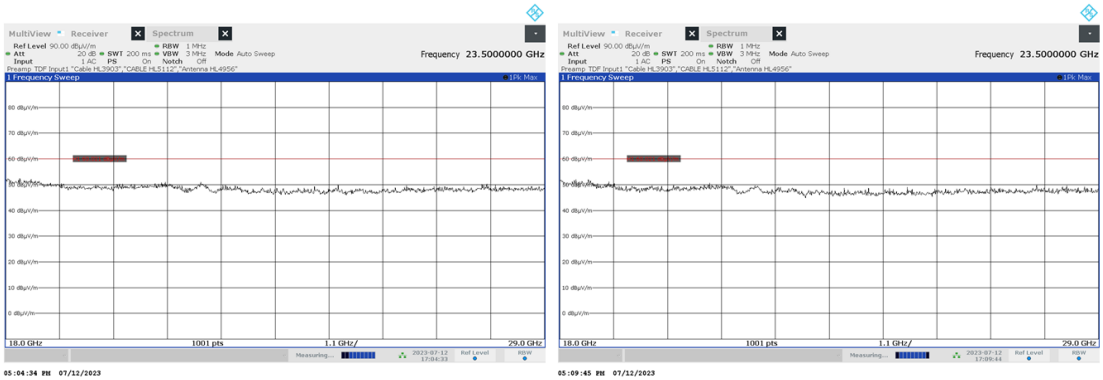
Plot 8.1.3 Radiated emission measurements 8000 - 18000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 1.5 m
EUT OPERATING MODE: Receive / Stand-by



Plot 8.1.4 Radiated emission measurements 18000 - 29000 MHz, vertical and horizontal antenna polarization

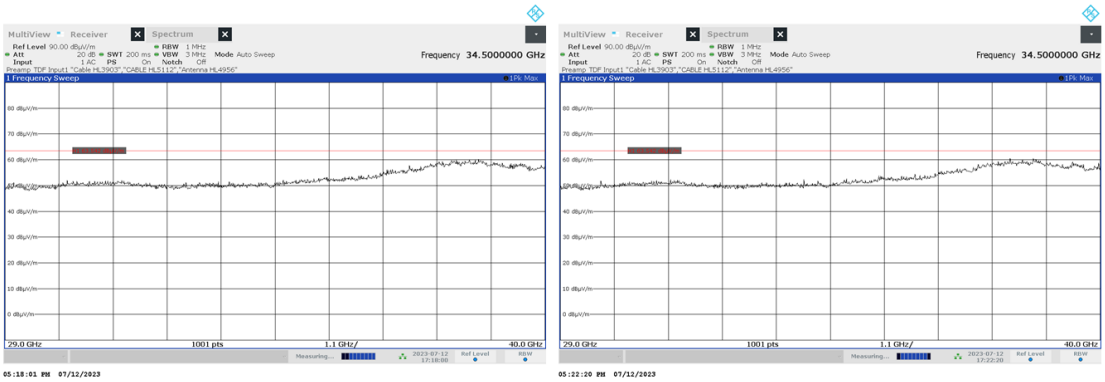
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 1.5 m
EUT OPERATING MODE: Receive / Stand-by



Test specification:	**Section 15.109, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Jul-23		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1007 hPa	**Power:** 230 VAC, 50 Hz
Remarks:			

Plot 8.1.5 Radiated emission measurements 29000 - 40000 MHz, vertical and horizontal antenna polarization

TEST SITE:	Semi anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	1.0 m
EUT OPERATING MODE:	Receive / Stand-by



9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0770	Antenna Standard Gain Horn, 40-60 GHz WR-19, U-band, 24 dB mid-band gain	Quinstar Technology	QWH-1900-AA	118	23-Nov-22	23-Nov-23
3230	Multimeter	Fluke	115C	94173028	10-Jul-22	10-Aug-23
3235	Harmonic mixer 40 to 60 GHz	Agilent Technologies	11970U	MY30030182	06-Mar-23	06-Mar-26
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	08-Jun-22	08-Jun-23
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	08-Jun-22	08-Jun-23
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1226/2A	16-Apr-23	16-Apr-24
4023	Diplexer for use OML mixers with Agilent spectrum analyzer	Oleson Microwave Labs	DPL.26	NA	20-Apr-23	20-Apr-24
4114	Antenna, Double-Ridged Waveguide Horn, 1 to 18 GHz	ETS Lindgren	3117	00123515	19-Jan-23	19-Jan-24
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	19-Jan-23	19-Jan-24
4956	Active horn antenna, 18 to 40 GHz	COM-POWER CORPORATION	AHA-840	105004	08-Mar-23	08-Mar-24
5112	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11SK/11SK/5500MM	502494/2EA	16-Apr-23	16-Apr-24
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	24-Mar-22	24-Mar-25
5371	EXG Analog Signal Generator, 9 kHz - 40 GHz	Keysight Technologies	N5173B	MY57280540	21-Dec-22	21-Dec-23
5376	EXA Signal Analyzer, 10 Hz - 32 GHz	Keysight Technologies	N9010B	MY57470404	27-Dec-22	27-Dec-23
5391	Temperature/Humidity Cycle Chamber, -77 - +177 deg., Humidity Range 20% RH to 95% RH	Thermotron	SM-8C	27737	14-Nov-22	14-Nov-23
5664	Cable, 1. SF102EA/11SK(x2)/5.5M, 40 GHz	Huber-Suhner	SF102EA	505603/2EA	07-Nov-22	07-Nov-23
5672	Cable SF126EA/11N(x2)/2M, 18GHz	Huber-Suhner	SF126EA	506757/126EA	21-Jul-22	21-Jul-23
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/11N/11N/6000	NA	08-Dec-22	08-Dec-23
6105	Field Probe Set, 5 un	NA	NA	NA	05-Sep-22	05-Sep-23
7546	Power supply 60VDC/12.5A	Agilent Technologies	N5747A	US25F6762C	16-May-23	16-May-24
7585	EMI Test Receiver, 1 Hz to 44 GHz	Rohde & Schwarz	ESW44	103130	19-May-22	19-Nov-23

10 APPENDIX B Test equipment correction factors

HL 4933: Active Horn Antenna
COM-POWER CORPORATION, model: AHA-118, s/n 701046

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
1000	-16.1
1500	-15.1
2000	-10.9
2500	-11.9
3000	-11.1
3500	-10.6
4000	-8.6
4500	-8.3
5000	-5.9
5500	-5.7
6000	-3.3
6500	-4.0
7000	-2.2
7500	-1.7
8000	1.1
8500	-0.8
9000	-1.5
9500	-0.2

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
10000	1.8
10500	1.0
11000	0.3
11500	-0.5
12000	3.1
12500	1.4
13000	-0.3
13500	-0.4
14000	2.5
14500	2.2
15000	1.9
15500	0.5
16000	2.1
16500	1.2
17000	0.6
17500	3.1
18000	4.2

The antenna factor shall be added to receiver reading in dBμV to obtain field strength in dBμV/m.

HL 4956: Active horn antenna
COM-POWER Corp., model: AHA-840, s/n 105004

Frequency, MHz	Measured antenna factor, dB/m	Frequency, MHz	Measured antenna factor, dB/m
18000	5.1	29500	1.4
18500	3.6	30000	2.9
19000	2.2	30500	2.9
19500	0.7	31000	2.9
20000	0.7	31500	1.2
20500	0.8	32000	0.7
21000	0.5	32500	0.2
21500	-1.3	33000	-1.7
22000	-2.1	33500	-2.2
22500	-2.0	34000	2.3
23000	-1.6	34500	-1.1
23500	-2.9	35000	0.7
24000	-2.3	35500	-1.1
24500	-2.6	36000	0.1
25000	-1.8	36500	1.4
25500	-1.2	37000	3.7
26000	-0.5	37500	5.8
26500	-1.2	38000	6.6
27000	-0.1	38500	7.3
27500	-1.0	39000	6.5
28000	-0.7	39500	7.3
28500	0.5	40000	7.1

The antenna factor shall be added to receiver reading in dBμV to obtain field strength in dBμV/m.

HL 5288: Trilog Antenna
Frankonia, model: ALX-8000E, s/n: 00809
30-1000 MHz

Frequency, MHz	Antenna factor, dB/m	Frequency, MHz	Antenna factor, dB/m
30	14.96	160	12.67
35	15.33	180	13.34
40	16.37	200	15.40
45	17.56	250	16.42
50	17.95	300	17.28
60	16.87	400	19.98
70	13.22	500	21.11
80	10.56	600	22.90
90	13.61	700	24.13
100	15.46	800	25.25
120	14.03	900	26.35
140	12.23	1000	27.18

The antenna factor shall be added to receiver reading in dBμV to obtain field strength in dBμV/m.

above 1000 MHz

Frequency, MHz	Antenna factor, dB/m	Frequency, MHz	Antenna factor, dB/m
1000	26.9	3600	38.9
1100	28.1	3700	39.4
1200	28.4	3800	39.4
1300	29.6	3900	39.6
1400	29.1	4000	39.7
1500	30.4	4100	39.8
1600	30.7	4200	40.5
1700	31.5	4300	40.9
1800	32.3	4400	41.1
1900	32.6	4500	41.4
2000	32.5	4600	41.3
2100	32.9	4700	41.6
2200	33.5	4800	41.9
2300	33.2	4900	42.3
2400	33.7	5000	42.7
2500	34.6	5100	43.0
2600	34.7	5200	42.9
2700	34.6	5300	43.5
2800	35.0	5400	43.6
2900	35.5	5500	44.3
3000	36.2	5600	44.7
3100	36.8	5700	45.0
3200	36.8	5800	45.0
3300	37.0	5900	45.3
3400	37.5	6000	45.9
3500	38.2		

The antenna factor shall be added to receiver reading in dBμV to obtain field strength in dBμV/m.

11 APPENDIX C Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
Carrier power conducted at antenna connector	± 1.7 dB
Carrier power radiated (substitution method)	± 4.5 dB
Occupied bandwidth	±8%
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz ± 13.9 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Unintentional radiator tests	
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

12 APPENDIX D Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.
Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for relevant parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; Recognized by Innovation, Science and Economic Development Canada for wireless and terminal testing (ISED), ISED #2186A, CAB identifier is IL1001; Certified by VCCI, Japan (the registration numbers for OATS are R-10808 for RE measurements below 1 GHz, G-20112 for RE measurements above 1 GHz, R-11082 for anechoic chamber for RE measurements below 1 GHz, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).
The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

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13 APPENDIX E Specification references

FCC 47CFR part 90: 2020	Private land mobile radio services
ANSI C63.10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.4: 2014	American National Standard for Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.4: 2014	American National Standard for Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

14 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
Ω	Ohm
PM	pulse modulation
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
WB	wideband

END OF DOCUMENT